



DEPARTMENT OF THE AIR FORCE  
59TH MEDICAL WING (AETC)  
LACKLAND AIR FORCE BASE TEXAS

28 January 2016

MEMORANDUM FOR SGOZ

ATTN: CAPT BRYANT J. WEBBER

FROM: 59 MDW/SGVU/CC

SUBJECT: Professional Presentation Approval

1. Your presentations, entitled **Preventing Exertional Collapse and Death in Military Training** have been approved to be presented to **Preventive Medicine 2016 (Am Coll Prev Med annual conference), Crystal City, VA, 26 Feb 16** for release in accordance with MDWI 41-108, and has been assigned local file #**16074**.
2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (phone or mail) that your article was published. At that time, we will need the name of the publishing company, month and year, issue volume of your published paper. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center Commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center's (WHASC) internship and residency programs.
3. Please know that the 59th Clinical Research Division cannot pay for reprints ordered from the journal by the authors. In addition, publisher's charges, as well as any charges for color photos, covers for your reprints, or any distinctive specifications, must be coordinated with your department for funding.
4. Congratulations, and thank you for your efforts and time to contribute to the body of medical knowledge. Your contributions directly impact the success of the military mission.
5. We look forward to assisting you in your future publication/presentation efforts.



Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC  
Director, Clinical Investigation & Research Support

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH PUBLICATIONS/PRESENTATIONS			
<b>TO:</b> Clinical Research Division/SGVU (59th CSPG/SGVU)	<b>FROM: (Name/Rank/Office Symbol)</b> Bryant J. Webber, Capt, USAF, MC 559 THLS/SGOZ		<b>PROTOCOL NUMBER:</b>  N/A
<b>PROTOCOL TITLE</b> N/A (review presentation; no original research)			
<b>1. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED</b> Preventing Exertional Collapse and Death in Military Training			
<b>2. IS THIS MATERIAL CLASSIFIED?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
<b>3. IS THIS MATERIAL SUBJECT TO ANY LEGAL RESTRICTIONS FOR PUBLICATION OR PRESENTATION THROUGH A COLLABORATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA), MATERIAL TRANSFER AGREEMENT (MTA), INTELLECTUAL PROPERT RIGHTS AGREEMENT, ETC.?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO    (NOTE: If the answer is 'YES' then attach a copy of the Agreement to the Publications/Presentations Request Form)			
<b>4. MATERIAL IS FOR (Check appropriate box or boxes for approval with this request.) (ATTACH COPY OF MATERIAL TO BE PUBLISHED/PRESENTED)</b>			
<input type="checkbox"/>	PUBLICATION/JOURNAL (List intended publication/journal)		
<input type="checkbox"/>	PUBLISHED ABSTRACT (List intended journal)		
<input type="checkbox"/>	POSTER (To be demonstrated at meeting/Name of Meeting, City, State, and Date of Meeting)		
<input checked="" type="checkbox"/>	PLATFORM PRESENTATION (At civilian institutions/Name of Meeting, State, and Date of Meeting) Preventive Medicine 2016 (Am Coll Prev Med annual conference), Crystal City, VA, 26 Feb 16		
<input type="checkbox"/>	OTHER (Describe; Name of Meeting, City, State, and Date of Meeting)		
<b>POINT OF CONTACT</b>			
<b>5. WHO IS THE PRIMARY WHASC POINT OF CONTACT? (Last, First, M.I.) (Include email)</b> Webber, Bryant J. (bryant.webber@us.af.mil)			<b>DUTY PHONE/PAGER No.</b> 671-4087
<b>AUTHORSHIP AND CO-AUTHOR(S) (List in the order they will appear in the manuscript)</b>			
LAST NAME, FIRST NAME AND MI.	GRADE/RANK	SQUADRON/GROUP/OFFICE SYM	INSTITUTION (If not 59 MDW)
a. Primary/corresponding author Webber, Bryant J.	O-3	559 THLS/ 559 MDG/ SGOZ	
b.			
c.			
d.			
e.			
f.			
g.			
h.			
i.			
i.			
<b>I CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401_IP AND 59 MDWI 41-108. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.</b>			
AUTHOR'S PRINTED NAME/RANK/GRADE Bryant Webber, Capt	AUTHOR'S SIGNATURE WEBBER.BRYANT.J.1270119383		DATE 17 Nov 2015
COMMANDER'S PRINTED NAME, RANK Gwendolyn Foster, Maj	COMMANDER'S SIGNATURE FOSTER.GWENDOLYN.A.1087836602		DATE 20 Nov 2015


PROCESSING OF PROFESSIONAL MEDICAL RESEARCH PUBLICATIONS/PRESENTATIONS		
<b>1st INDORSEMENT (SGVU Use Only)</b>		
<b>TO: Clinical Research Division</b> <b>59TH CSPG/SGVU</b> <i>(Contact 292-7141 for email instructions)</i>	<b>1. DATE RECEIVED</b> <div style="text-align: center;">11 Jan 2016</div>	<b>2. ASSIGNED PROCESSING REQUEST FILE NUMBER</b> <div style="text-align: center;">16074</div>
<b>3. DATE REVIEWED</b> <div style="text-align: center;">27 Jan 2016</div>		<b>4. DATE FORWARDED TO PA</b>
<b>5. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES</b> <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES <i>(If yes, give date)</i> <input type="checkbox"/> N/A		
<b>6. COMMENTS</b> <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED The presentation is approved.		
<b>PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</b> Rocky Calcote, PhD Clinical Research Administrator	<b>SIGNATURE OF REVIEWER</b> <div style="border: 1px solid black; padding: 2px; text-align: center;">CALCOTE.ROCKY.D.1178245844</div>	<b>DATE</b> <div style="text-align: center;">27 Jan 2016</div>
<b>2ND INDORSEMENT (PA Use Only)</b>		
<b>TO:</b> <b>OFFICE OF PUBLIC AFFAIRS (PA)</b>	<b>1. DATE RECEIVED</b> <div style="text-align: center;">27 Jan 16</div>	<b>2. DATE FORWARDED TO 59TH CSPG/SGVU</b> <div style="text-align: center;">28 Jan 16</div>
<b>3. COMMENTS</b> <input checked="" type="checkbox"/> APPROVED <i>(In compliance with security and policy review directives)</i> <input type="checkbox"/> DISAPPROVED		
<b>PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</b> Christopher Carwile, TSgt/E-6, NCOIC, PA	<b>SIGNATURE OF REVIEWER</b> <div style="border: 1px solid black; padding: 2px; text-align: center;">CARWILE.CHRISTOPHER.STEWART.1280477229,</div>	<b>DATE</b> <div style="text-align: center;">28 Jan 2016</div>
<b>3RD INDORSEMENT (SGVU Use Only)</b>		
<b>TO: 59 CSPG/SGVU</b>		<b>1. DATE RECEIVED</b>
<b>2. SENIOR AUTHOR NOTIFIED BY PHONE OF APPROVAL OR DISAPPROVAL</b> <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> COULD NOT BE REACHED <input type="checkbox"/> LEFT MESSAGE		
<b>3. DATE WRITTEN NOTICE OF APPROVAL AND CLEARNCE MAILED TO AUTHOR:</b>		
<b>4. COMMENTS</b> <input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED		
<b>PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER</b>	<b>SIGNATURE OF REVIEWER</b>	<b>DATE</b>





Warrior Medics – Mission Ready – Patient Focused

## Preventing Exertional Collapse and Death in Military Training



**Bryant Webber, MD, MPH**  
 Captain, USAF, MC  
 Trainee Health Surveillance  
 Joint Base San Antonio – Lackland, TX



26 February 2016

## Learning Objectives

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1. List the primary causes of recruit mortality in the U.S. armed forces
2. Describe the impact of sickle cell trait on health outcomes in terms of relative and absolute risk
3. Prioritize the response to a collapsed recruit based on the epidemiology and severity of potential causes

## Disclaimers

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The views expressed herein are those of the presenter and do not reflect the official policy or position of Joint Base San Antonio, the Department of the Air Force, the Department of Defense, or the U.S. Government.

I or my spouse do not have, and have not had, in the last 12 months, any relevant financial or other relationship with any proprietary entity producing, marketing, re-selling or distributing health care goods or services including the manufacturer of any commercial product or device I will discuss during my presentation.






## Annual Recruit Population†

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<b>33,000</b>	<b>37,000</b>	<b>35,500</b>	<b>110,500</b>
8 weeks	8 weeks	13 weeks	10 weeks
One location	One location	Two locations	Four locations



† Population representation in the military services, FY 2011. <http://phome.defense.gov/RF/MMP/AP/POPREP.aspx>

## Agenda


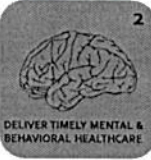
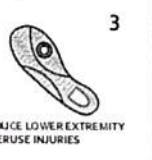

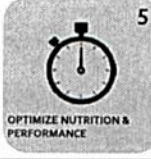

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- Learning Objectives
- Population
- Air Force Recruit Health Priorities
- Recruit Mortality
- Working Group
  - Risk Factors for Exertional Collapse
  - Sickle Cell Trait
  - Collapsed Recruit Algorithms for First Responders

## AF Recruit Health Priorities

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 <p>1 LIMIT COMMUNICABLE DISEASES</p>	 <p>2 DELIVER TIMELY MENTAL &amp; BEHAVIORAL HEALTHCARE</p>	 <p>3 REDUCE LOWER EXTREMITY OVERUSE INJURIES</p>
 <p>4 PREVENT &amp; IMPROVE CARE FOR EXERTIONAL COLLAPSE</p>	 <p>5 OPTIMIZE NUTRITION &amp; PERFORMANCE</p>	 <p>6 COUNTER ZOONOTIC &amp; VECTOR-BORNE THREATS</p>

AF Recruit Health Priorities (2)					Warrior Medics – Mission Ready – Patient Focused
Incidence	Severity	Impact	Total		Preventive Medicine Interventions
	3	4	5	12	Outbreak responses, TB screening, immunizations, streptococcus prophylaxis, febrile respiratory surveillance
	4	3	4	11	Hospitalization registry, mental health attrition registry, data requests
	5	2	4	11	Injury epidemiology, athletic trainer study, stress fracture registry, physical fitness program review
	1	5	2	8	Exertional collapse protocols, heat illness deferral, officers, sickle cell trait education, rhabdomyolysis workup
	3	1	3	7	Tobacco cessation efforts, anemia studies, female multivitamin initiative, coordination with Nutrition Team
	1	4	1	6	Bed net use, Chagas disease research, coordination of insecticide spraying and animal control activities

## Working Group

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**Cardiac**

**Sudden Unexplained**

**Heat**

**Topics**

- Risk factors for exertional collapse
- Sickle cell trait
- First responder approach to collapsed recruit

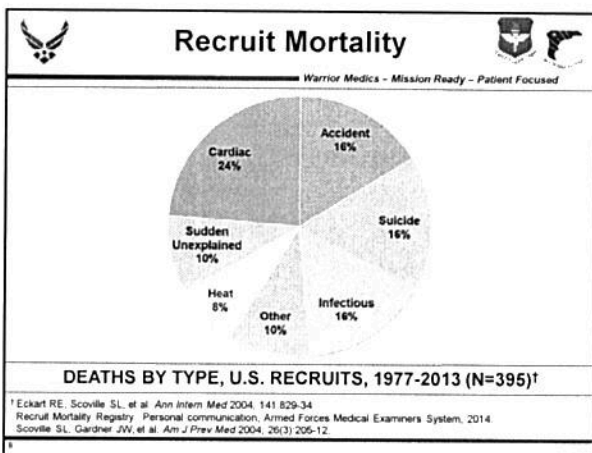
**Partners**

- Consortium for Health and Military Performance
- Korey Stringer Institute

CHAMP  
U.S. Army Center of Excellence  
for Warrior Performance

KSI  
Korey Stringer Institute  
University of Connecticut School of Medicine  
Preventing sudden death in sports

Used with permission: COL (Dr.) Francis O'Connor, Associate Director; Dr. Douglas Casa, Chief Operating Officer



## Working Group (2)

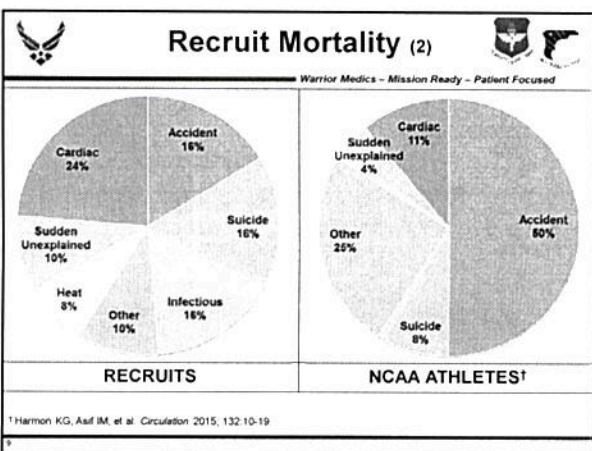
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**Actions**

- Reviewed literature on exertional collapse and sickle cell trait
- Identified 15 known and suspected risk factors
- Stratified best practices by pre-training, training, and at event
- Reviewed sickle cell trait topics
- Built collapsed recruit algorithms for first responders

**Self-Assessment**

- Green: best practices being followed
- Yellow: doing well but can be improved
- Red: need to improve
- Black: not applicable



## Risk Factors for Collapse

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	Pre-Training	Training	At Event
Sickle cell trait			
Poor cardiovascular fitness			
Poor health and fitness knowledge			
Underlying medical condition			
Inadequate medical assets			
Unsafe training			
Overaggressive motivation			
Recent blood donation			
Dehydration			
Tobacco use			
Nutritional supplement use			
Current illness			
Lack of heat acclimatization			
Lack of exercise acclimatization			
Improper triage			

For additional info: Webber BJ, Casa DJ, et al. MJM 2016, in press

## Risk Factors for Collapse (2)

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Poor cardiovascular fitness

Produce "Couch to BMT" video and app for potential recruits; engage recruiters and MEPS

Inadequate medical assets

Update heat stroke policies; build cold water immersion stations; hire athletic trainers

Recent blood donation

Change timing of voluntary blood donation (from before the final fitness test until after)

## Algorithms

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- Master algorithm that funnels into three sub-algorithms
  - Cardiac Care Algorithm
  - Hyperthermia Algorithm
  - Exertional Collapse Algorithm
- Standardizes approach to managing a collapsed recruit, removing guesswork and saving time
- Prioritizes the potential cause of collapse, based on the immediacy of needed treatment and the latest science
- Unlike other algorithms, accounts for sickle cell trait

## Risk Factors for Collapse (3)

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	Pre-Training	Training	At Event
Sickle cell trait			
Poor cardiovascular fitness			
Poor health and fitness knowledge			
Underlying medical condition			
Inadequate medical assets			
Unsafe training			
Overaggressive motivation			
Recent blood donation			
Dehydration			
Tobacco use			
Nutritional supplement use			
Current illness			
Lack of heat acclimatization			
Lack of exercise acclimatization			
Improper triage			

## Algorithms (2)

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For additional info: Webber BJ, Casa DJ, et al. *Mil Med* 2016, in press.

## Sickle Cell Trait

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- Heterozygotic carrier state ( $HbA/HbS$ )<sup>1</sup>
- Affects ~3 million people in U.S.<sup>1</sup> and ~1% of Air Force recruits<sup>2</sup>
- Associated with increased risk of morbidity and mortality in some populations
  - Sudden death: among military recruits\* (RR 38.5) and Div I football players<sup>4</sup> (RR 37)
  - Rhabdomyolysis: among Air Force recruits<sup>5</sup> (RR 5.5; PAF 4.2%)
- U.S. military services have different screening and education policies<sup>6</sup>
- Topics addressed by working group
  - Screening
  - Identification and education of SCT+ recruits
  - Management of collapsed SCT+ recruits
  - Workup/return to training determination following collapse
  - Critical knowledge gaps

<sup>1</sup>Ashley-Koch A, Yang Q, Olney RS. *Am J Epidemiol* 2000; 151:839-45.  
<sup>2</sup>Webber BJ, Witkop CT. *Mil Med* 2014; 179(11):1184-89.  
<sup>3</sup>Kark JA, Posey DM, et al. *New Engl J Med* 1987; 317(13):781-7.  
<sup>4</sup>Harmon KG, Drezner JA, et al. *Br J Sports Med* 2012; 46(5):325-30.  
<sup>5</sup>O'Connor FG, Bergeron MF, et al. *Med Sci Sports Exerc* 2012; 44(11):2045-56.

## Questions?

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